

What is claimed is:

1. A costimulating molecule
- a) having the biological activity of costimulation of T cells,
- b) which occurs on activated CD4⁺ and CD8⁺ T lymphocytes but not resting or activated B cells, granulocytes, monocytes, NK cells or dendritic cells, and
- c) which has two polypeptide chains, the said molecule having a molecular weight of about 55 to 60 kDa determined in a nonreducing SDS polyacrylamide gel electrophoresis, and the two polypeptide chains of the said molecule having a molecular weight of about 27 kDa and about 29 kDa measured in a reducing SDS polyacrylamide gel electrophoresis.
2. A costimulating molecule having the biological activity of costimulation of T cells comprising an amino-acid sequence which shows at least 40% homology with the sequence comprising 199 amino acids in Fig. 15 (SEQ ID NO:2), or a biologically active fragment or an analogue thereof.
3. A costimulating molecule having the biological activity of costimulation of T cells according to Claim 2 and comprising the amino acid sequence shown in Fig. 15 (SEQ ID NO:2), or a biologically active fragment or an analogue thereof.
4. A DNA sequence which encodes a costimulating molecule according to Claim 1 or a fragment thereof.
5. A DNA sequence which encodes a costimulating molecule according to Claim 2 or a fragment thereof.
6. A DNA sequence encoding a costimulating molecule having the biological activity of costimulation of T cells, the sequence being selected from the group consisting of:
- a) the DNA sequence shown in SEQ ID NO:1 (Fig. 16) and its complementary strand
- b) DNA sequence hybridizing with the sequences in (a) and
- c) DNA sequences which, because of the degeneracy of the genetic code, hybridize with the sequences in (a) and (b).
7. A plasmid or a viral DNA vector comprising a DNA sequence according to Claim 4.
8. A plasmid or a viral DNA vector comprising a DNA sequence according to Claim 5.
9. A prokaryotic or eukaryotic host cell stably transformed or transfected with a plasmid or DNA vector according to Claim 4.

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10. A prokaryotic or eukaryotic host cell stably transformed or transfected with a plasmid or DNA vector according to Claim 5.
- 5 11. Method for preparing a costimulating molecule according to Claim 1, comprising the cultivation of the host cell according to Claim 9 for expression of the said molecule in the host cell.
12. Method for preparing a costimulating molecule according to Claim 1, comprising the cultivation of the host cell according to Claim 10 for expression of the said molecule in the host cell.
- 10 13. Method for preparing a costimulating molecule according to Claim 2, comprising the cultivation of the host cell according to Claim 9 for expression of the said molecule in the host cell.
14. Method for preparing a costimulating molecule according to Claim 2, comprising the cultivation of the host cell according to Claim 10 for expression of the said molecule in the host cell.
- 15 15. An antibody which binds a costimulating molecule according to Claim 1.
16. An antibody which binds a costimulating molecule according to Claim 2.
17. An antibody according to Claim 15, which is a monoclonal antibody.
- 20 18. An antibody according to Claim 16, which is a monoclonal antibody.
19. A monoclonal antibody which specifically recognizes a costimulating molecule according to Claim 1, characterized in that B cells of mice which are immunized with human T lymphocytes activated PMA and the Ca^{2+} ionophore ionomycin are fused with a myeloma cell line to
25 give an antibody-secreting hybridoma, and the monoclonal antibodies are purified in flow cytometry for 2-signal molecule-activated against resting T cells.
20. A monoclonal antibody which specifically recognizes a costimulating molecule according to Claim 2, characterized in that B cells of mice which are immunized with human T lymphocytes activated PMA and the Ca ionophore ionomycin are fused with a myeloma cell line to
30 give an antibody-secreting hybridoma, and the monoclonal antibodies are purified in flow cytometry for 2-signal molecule-activated against resting T cells.

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